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ACRONEURIA COVELLI (PLECOPTERA: PERLIDAE), A NEW STONEFLY SPECIES FROM EASTERN NORTH AMERICA

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Abstract.—A new species of Nearctic Perlidae, ***Acroneuria covelli***, is described from the Ohio River traversing the Indiana-Kentucky border, the White River in southern Indiana, and a single female from Tennessee. This new species can be assigned to the *A. flinti* species group based on structural characteristics of the egg, yet also placed in the *A. internata* species group according to aedeagal armature.

Key Words: Plecoptera, Perlidae, *Acroneuria*, new species

The Nearctic genus *Acroneuria* has been the subject of systematic restructuring during the last three decades. Stark and Gaufin (1976) revised the taxon, describing two new species and placing all the then-known twelve species into seven species groups based on aedeagal and egg characters. Kondratieff and Kirchner (1988, 1993) described species from Kentucky (*A. hitchcocki*) and Virginia (*A. kosztarabi*), Poulton and Stewart (1991) introduced *A. ozarkensis* as new to science from Arkansas and Missouri, and Stark and Kondratieff (2004) added *A. kirchneri* from Kentucky, Virginia, and West Virginia. Lastly, Stark and Brown (1991) synonymized *A. mela* Frison with the true *A. evoluta* Klapalek, and named *A. frisoni* for the species originally assigned to the old *A. evoluta*.

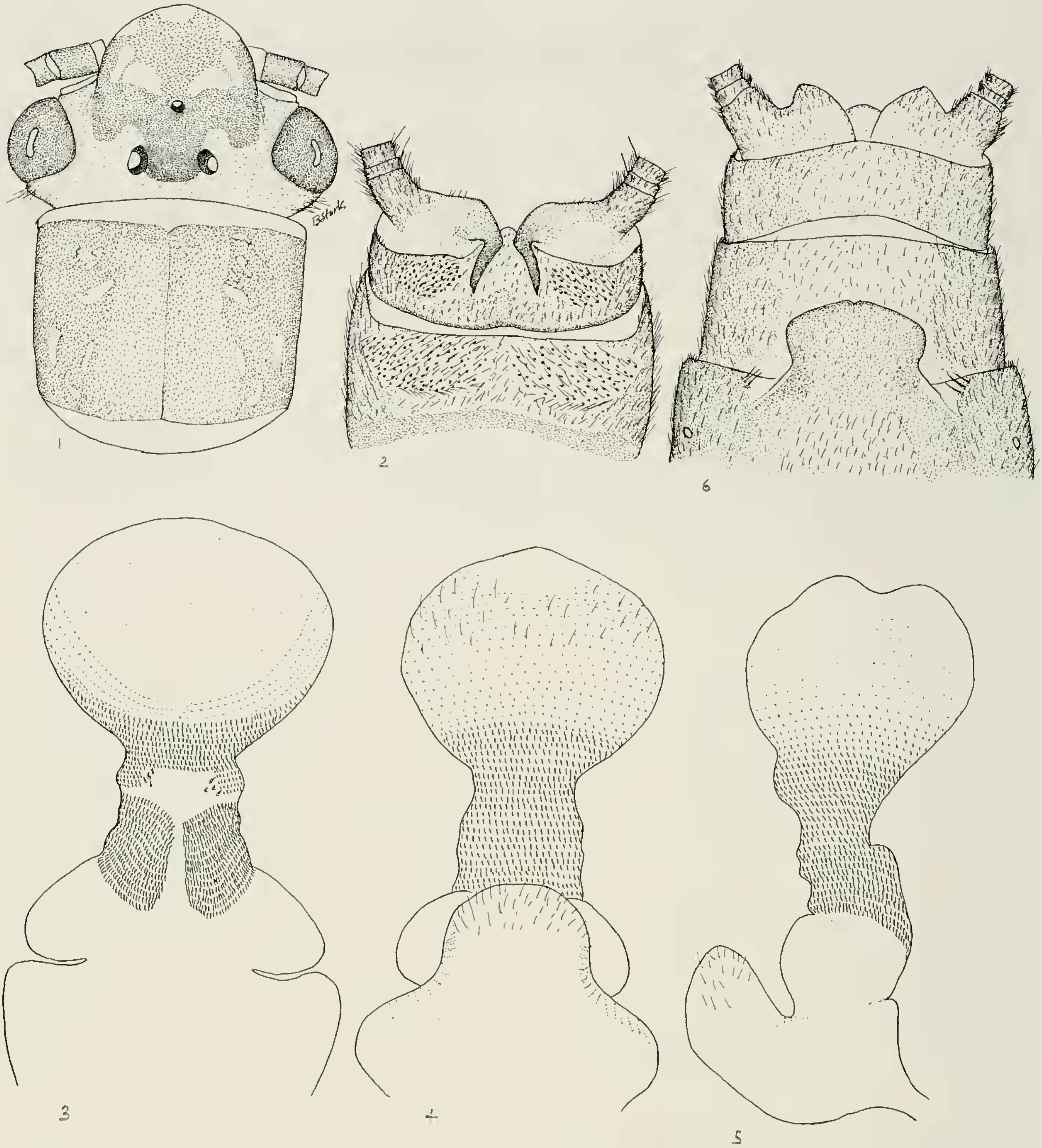
Females had been acquired by the second author from two localities, Knoxville, Tennessee, and Louisville, Kentucky, that superficially resembled *A. ozarkensis*, yet presented enough morphological differentiation to suggest these specimens belonged to a different species. In concordance with a study of Indiana Plecoptera by the first author, light-trapping for summer-emergent Perlidae along the Ohio River produced males and gravid females of a new species of *Acroneuria* that corresponded to the aforementioned females. Morphological terminology follows Stark and Gaufin (1976).

The holotype and a paratype female are deposited in the Illinois Natural History Survey. The remaining paratypes are deposited in the B. P. Stark collection at Mississippi College (BPS), the S. A. Grubbs collection at Western Kentucky University (WKU), the Illinois Natural History Survey (INHS), and at the University of Louisville (UL).

Acroneuria covelli Grubbs and Stark, new species

(Figs. 1–7)

Male.—Macropterous. Forewing length 23–24 mm. Head pattern with dark interocellar patch expanded laterally around anterior ocellus but interrupted by pale M-line; occiput pale (Fig. 1). Pronotum brown with scattered pale rugosities (Fig. 1). Wing membrane translucent brown, veins dark brown. Femora dark brown dorsally and near apex, anterior face with irregular lon-



Figs. 1–6. *Acroneuria covelli.* 1, Adult head and pronotum, dorsal view. 2, Male terminalia, dorsal view. 3, Aedeagus, dorsal view. 4, Aedeagus, ventral view. 5, Aedeagus, lateral view. 6, Female terminalia, ventral view.

gitudinal pale and brown bands; tibiae brown except for narrow pale spot near femur. Hammer typical; paraprocts slender, recurved, apically acute (Fig. 2) and strongly hooked in lateral aspect. Abdominal terga 8–10 with well-developed patches of sensilla basiconica (Fig. 2). Apical aedeagal lobe balloon-like and broadly armed over most of dorsum and venter with a continuous patch of spinules (Figs. 3, 4); apical and basal patches separated on dorsum but continuous on venter; basal patch narrowly divided on meson. Basal aedeagal lobe expanded into apically directed lobe sparsely covered with fine setae (Fig. 5).

Female.—Macropterous. Forewing length 25–27 mm. Color similar to male. Subgenital plate with lateral margins

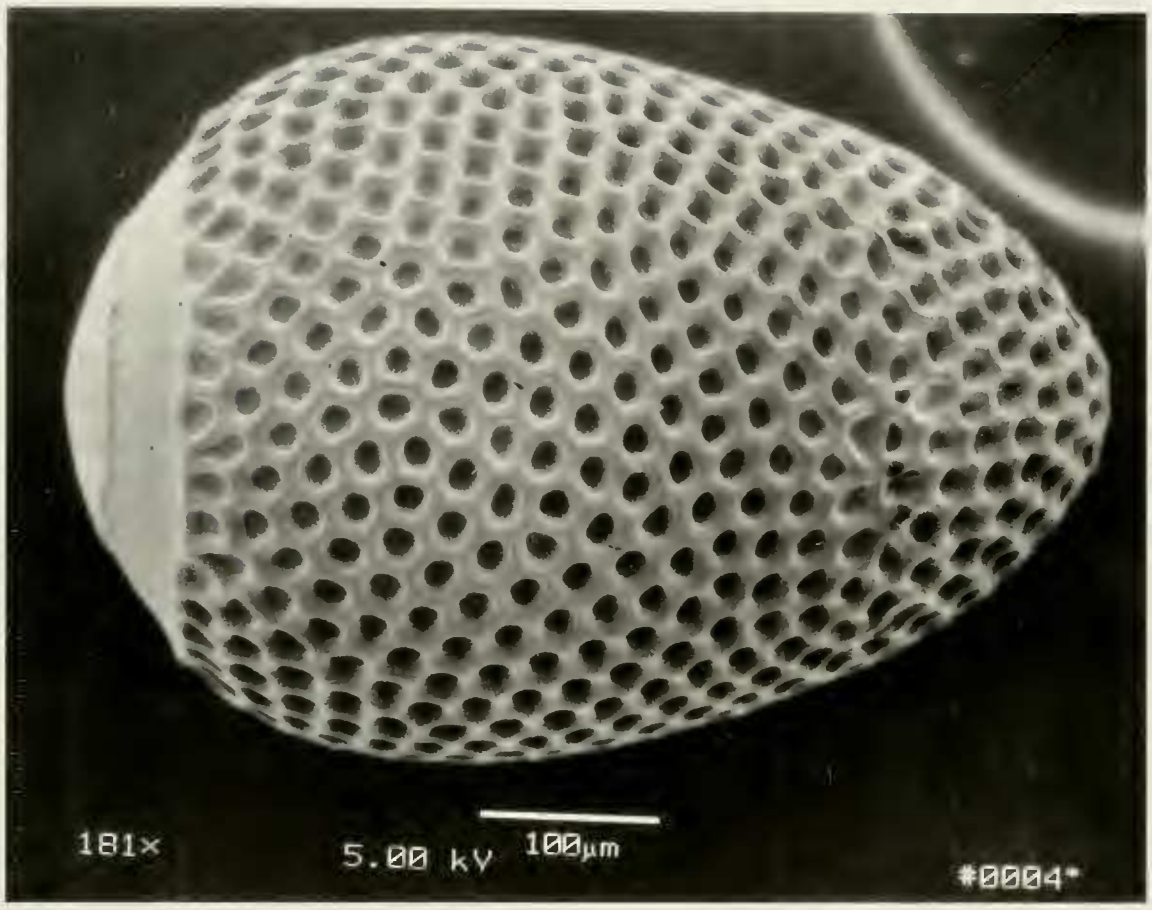


Fig. 7. *Acroneuria covelli*, egg.

strongly constricted near midlength; apical margin entire or with slight medial notch; plate covering ⅓ to ½ of 9th sternite (Fig. 6). Abdomen with contrasting dark and yellow pigmentation, with light color extending as a wide longitudinal stripe both dorsally and ventrally. Dark pigmentation extends onto lateral margins of subgenital plate on some specimens.

Egg.—Length 0.58–0.60 mm, width 0.40–0.41 mm. Pear-shaped in outline, cross-section circular, collar button-like. Chorion coarsely pitted throughout except for smooth zone surrounding collar; smooth zone length about 0.05 mm (Fig. 7). Micropyles set in apical third of egg and surrounded by irregular rosettes of 5–6 follicle cell impressions.

Nymph.—Unknown.

Material examined.—Holotype ♂, Indiana, Floyd Co., Ohio River, New Albany, 28 June 2002, S. A. Grubbs (INHS). Paratypes, same data as holotype, 3 ♀ (WKU); same location but 5 July 2003, S. A. Grubbs, 4 ♀ (WKU); Harrison Co., Ohio River, Leavenworth, 28 June 2002, S. A. Grubbs, 1 ♂ (WKU); Indiana, Martin Co., White River, 6 mi NE Shoals, 24 June 1965, J. Donahue and L. Donahue, 1 ♂ (BPS); Kentucky, Jefferson Co., Louisville, 25 June 2001, C. V. Covell, 1 ♀ (UL); Tennessee, Knox Co., Knoxville, 10 June 1939, A. C. Cole, 1 ♀ (INHS).

Etymology.—This species is named for Dr. Charles Covell, University of Louisville, for his rich contributions to Lepidoptera systematics and biology and many collections of Kentucky stoneflies.

Diagnosis.—The placement of *A. covelli* in a species group as defined by Stark and Gaufin (1976) is problematic, a conundrum shared by *A. kosztarabi* and *A. ozarkensis*. If based solely on egg characteristics, *A. covelli* would be aligned within the *A. flinti* group. Both *A. flinti* Stark and Gaufin and *A. kosztarabi* possess eggs that are covered with coarse pits over the entire surface, but these are easily distinguished from the eggs of *A. covelli* and *A. ozarkensis* which each have a smooth zone surrounding the collar.

Females of *A. covelli* and *A. ozarkensis* are virtually identical except that the pronounced elevation of the collar observed in *A. ozarkensis* is absent for *A. covelli* (Fig. 7).

Acroneuria covelli can also be placed into the *A. internata* group according the aedeagal armature. The aedeagus of *A. covelli* is similar to that of *A. internata* (Walker) and *A. petersi* Stark and Gaufin in bearing an apically directed, basoventral lobe, but, in the latter two species, the ventral spinule patch is expanded over this lobe (Stark and Gaufin 1976), whereas in the new species this lobe is armed only with a sparse patch of long thin setae (Figs. 4, 5). Additionally, the male aedeagus of *A. ozarkensis* lacks the apically directed ventral lobe and has the ventral spinule patch distinctly narrowed near midlength. In *A. covelli,* this patch covers the entire ventral surface (Fig. 4).

The nymph of *A. covelli* is unknown. Because the type locality (Ohio River, Indiana/Kentucky) and one paratype locality (White River, Indiana) are large lowland rivers, nymphal habitat is presumably either nearshore inorganic substratum or large woody debris. Formal description of the immature stage and documentation of habitat will await successful rearing and association of nymphal and adult stages.

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